

Episode overview: Congestive heart failure

Congestive heart failure (CHF) is one of several clinical areas prioritized for inclusion in the 2012 Arkansas Payment Improvement Initiative. This working paper summarizes the core concepts of this episode and explores the potential challenges and implications of adopting an episode-based payment across five topic areas:

- *Overview of congestive heart failure*
- *Baseline utilization and cost patterns*
- *Quality, patient experience, and efficiency*
- *Clinical, operational, and financial challenges*
- *Key design decisions for new payment model(s)*

This document will be refined with input from participants in the Cardiovascular Workgroup, independent experts and other interested parties.

OVERVIEW OF CONGESTIVE HEART FAILURE

Congestive heart failure (CHF), or heart failure, is a common syndrome that can arise as a result of any cardiac disorder that impairs the ability of the ventricle to fill with or pump blood, including myocardial infarction and other forms of ischemic heart disease, hypertension, valvular heart disease, and cardiomyopathy, among others.¹ It is characterized by a constellation of symptoms, typically shortness of breath, fatigue, and fluid retention.

CHF can be acute, subacute, or chronic.² Some patients present with acute heart failure for the first time in an emergency room; others may present with symptoms at a physician's office. Patients with chronic heart failure are often treated in a hospital setting for acute exacerbations, particularly as the disease progresses. [EXHIBIT 1]

Two primary types of CHF include systolic and diastolic, each comprising roughly 40-60% of cases.³ Though these two types of CHF have different

¹ A myocardial infarction is a heart attack; ischemic heart disease is disease caused by inadequate blood supply to the heart, often caused by diseased arteries supplying the heart; hypertension is high blood pressure; valvular heart disease is disease of the heart valves; cardiomyopathy is deterioration of the heart muscle.

² Acute is rapid in onset; chronic is persisting; subacute is between acute and chronic and indicates a recent onset that was less rapid than acute.

³ In layman's terms, systolic heart failure is the inability of the heart to squeeze enough blood forward, whereas diastolic heart failure (HFpEF) is the inability of the heart to relax to fill with blood before pumping forward.

pathophysiologies, similar medications are used for both, and both types require the same array of providers and care.⁴

The American College of Cardiology and American Heart Association has outlined a classification system:ⁱ

- Stage A: High risk for heart failure, without structural heart disease or symptoms
- Stage B: Heart disease with asymptomatic left ventricular dysfunction⁵
- Stage C: Prior or current symptoms of heart failure
- Stage D: Refractory end stage heart failure

The New York Heart Association classification is also commonly used and divides patients into four classes based on functional status:ⁱⁱ

- Class I: No symptoms and no limitation on physical activity
- Class II: Mild shortness of breath and/or angina⁶ and slight limitation during ordinary activity
- Class III: Marked limitation in activity due to symptoms; even walking short distances causes fatigue, palpitation, or shortness of breath; comfortable only at rest
- Class IV: Severe limitations, experiences symptoms even while at rest; unable to carry out any physical activity without discomfort

A patient may move between two classes. For instance, a patient may be listed as Class III at diagnosis or during an acute episode, but may be a Class II patient once medically managed or returned to baseline. This potential for change in classification will have implications for payment design.

The goals of treatment are to address the underlying cause of heart failure (e.g., hypertension, ischemic heart disease, valvular disease), to relieve symptoms (e.g., shortness of breath, fatigue) and to slow progression of heart failure and prolong patient survival. Treatment selection varies according to the class/stage of a patient's disease.

⁴ For instance, heart failure medications for systolic dysfunction are optimized for neurohormonal blockade using beta-blockers, ACE inhibitors or ARBs, and aldosterone antagonists; these same kinds of medications are used for diastolic dysfunction, albeit for different reasons (e.g., rate control with beta-blockers, regression of LVH with ACE inhibitors, reduction of intracardiac fibrosis with aldosterone inhibitors). One medication that is not used in diastolic heart failure is digoxin; although used occasionally for systolic CHF, it is contraindicated for diastolic CHF. Additionally, management of atrial fibrillation is critical in patients with diastolic dysfunction; conversion to and maintenance of normal sinus rhythm is advisable, and rate control is paramount in patients in whom sinus rhythm cannot be restored or maintained.

⁵ The left ventricle is the chamber of the heart that pumps blood forward to the rest of the body and thus is studied via echocardiogram in heart failure.

⁶ Chest pain due to insufficient blood supply to the heart, often due to diseased arteries supplying blood to the heart.

Treating congestive heart failure involves primary care physicians, internists, cardiologists (sometimes specializing in heart failure), electrophysiologists,⁷ nurse case coordinators, Emergency Department physicians, hospitalists, pharmacists, cardiac rehabilitation specialists.

For purposes of episode-based payment, we may consider that a heart failure episode begins with a diagnosis and ends after a fixed length of time (e.g., one year). After the initial period a new fixed-length episode would begin. During the episode, some (but not necessarily all) services provided related to the diagnosis would be included. This could include office visits, medication, medical management, selected procedures, and hospitalizations directly attributable to heart failure or to complications.

BASELINE UTILIZATION AND COST PATTERNS

Arkansas had 11,434 hospital discharges for congestive heart failure in 2009.ⁱⁱⁱ Medicare is the payor for the majority of Arkansas treated for CHF. 3% of Arkansas Medicare spending goes toward treatment of CHF, or about \$128 million. This is in addition to approximately 1.2% of Commercial payor spending and 0.4% of Medicaid spending that goes to CHF.

Hospitals and other inpatient facilities consume the largest portion of payments to providers, representing 44% of total spending, based on an average length of stay of 4.7 days. Physician and outpatient facilities each consume about 15% of the total cost, and ancillary services comprise 29% (e.g., ambulance transport, durable medical equipment).

OPPORTUNITY TO IMPROVE QUALITY, PATIENT EXPERIENCE, AND EFFICIENCY FOR CONGESTIVE HEART FAILURE PATIENTS

An examination of the clinical and economic literature, combined with expert interviews, suggests several opportunities to ensure quality, patient experience, and efficiency for congestive heart failure patients. The most meaningful opportunities are outlined below.

There is significant potential to reduce the incidence and prevalence of heart failure in Arkansas through prevention and population health strategies. Heart failure is a common syndrome that results from multiple cardiac illnesses, including coronary artery disease, and many Arkansans have risk factors for coronary artery disease. Optimal management of population health and control of obesity, hypertension, diabetes, smoking, and other risk factors could significantly reduce the incidence and prevalence of CHF. This opportunity, however, is less likely to be directly addressed via an episode model.

1. Increase use of standard of care therapies

⁷ Electrophysiologists are sub-specialized cardiologists who specialize in cardiac electrical conduction/heart rhythms and pacemakers and related devices.

An estimated 68,000 lives nationally could be saved each year with increased use of evidence-based therapies;^{iv} this translates to nearly 700 lives in Arkansas each year. Management of CHF is defined in part by a menu of standard therapies that most or all patients should receive. However, studies find that providers apply these therapies inconsistently. Only 27% of outpatients with reduced ejection fraction⁸ are receiving all of the recommended therapies for which they are eligible (e.g., ACE inhibitor or ARB, heart failure education).

Nationally, 86% of CHF outpatients who would benefit from taking a beta blocker receive the medication. 36% of patients who would benefit from taking an aldosterone antagonist receive the medication.^v Similar studies of hospitalized CHF patients have found appropriate medication use rates of 88.5% for ACE inhibitors/ARBs, 91.6% for beta blockers, and 71.9% for aldosterone antagonists.^{vi}

Data published by the Centers for Medicare and Medicaid Services indicate variation in the use of four standard process measures for CHF patients in Arkansas:

- Individual hospitals within Arkansas range from 84% to 100% in the percent of their patients who have an evaluation of left ventricular function. The AR average is 97%; the U.S. average is 98%.^{vii}
- Individual hospitals within Arkansas range from 81% to 100% in the percent of their qualifying patients who are receiving an ACE inhibitor or ARB therapy. The AR average is 94%; the national average is 95%.
- Individual hospitals within Arkansas range from 72% to 100% on percent of the time their heart failure patients receive discharge instructions.
- Individual hospitals within Arkansas consistently counsel 97% to 100% of heart failure patients on smoking cessation.^{viii}

Participation in one of the national heart failure registries have been associated with improved use of guideline-recommended therapies and improved outcomes for patients.^{ix} Using the AHA “Get with the Guidelines Program,” for instance, hospitals can enter their own data in the registry, compare performance to other hospitals, and access performance management tools.^x The AHA reports that 259 hospitals that used the guidelines program for heart failure reduced by 20% the risk that the patients would die or be hospitalized in the first 60 days after discharge.

2. Reduce hospitalizations through improved disease management and care coordination

⁸ Ejection fraction indicates the fraction of blood that is pumped forward of all blood that fills the heart. The relevance here is that the study focused on one type of CHF patient in the study.

Patients with heart failure have some of the highest rates of hospitalization of any patient group, and CHF is the most common diagnosis in hospital patients age 65 and over.^{xi} Between 2000 and 2006, the annual rate of hospitalization was 21.5 per 1,000 among Medicare beneficiaries nationally.^{xii} Hospitalizations for heart failure have trended down over the past decade; between 1998 and 2007, the annual rate of hospitalization decreased 29.5% nationally.^{xiii} While Arkansas's rate of CHF hospitalizations improved over that time, 33 states had a greater improvement.^{xiv}

Studies have shown that this high rate of hospitalization is addressable. For example, CHF is a leading area in which disease and case management programs (encompassing a range of care coordination and longitudinal patient support)^{9,10} have been successful. A 2007 RAND meta-analysis found conclusive evidence that disease management programs reduce hospitalizations.^{xv} Disease management programs also have been shown to lead to better medication usage, improvement in clinical status,¹¹ reduced readmissions, reduced length of stay, and better use of cardiologist skill set.^{xvi}

Success on these metrics corresponds to cost savings: a review of 44 studies found that cost of a disease management program for CHF averaged \$1,399 and savings averaged \$3,884, per member. The average ROI across all studies was \$2.78.^{xvii}

3. Improve efficiency of inpatient care

Among Arkansas hospitals, average length of stay and cost for a CHF case varies widely:^{xviii}

- For CHF without complications or comorbidities, time in the hospital ranges from 2.2 days to 5.3, while the average hospital cost for a given hospital ranges from \$2,800 to \$7,100¹²
- For CHF with complications or comorbidities, length of stay ranges from 2.8 days to 5.8 days; the average hospital cost for a given hospital ranges from \$3,400 to \$8,300
- The length of stay for CHF patients with major complications/comorbidities ranges from 4.0 to 7.5; the average hospital cost for a given hospital ranges from \$5,800 to \$10,800

⁹ Examples of disease/case management activities identified by review authors include the following (not exhaustive): offer personalized risk-reduction counseling to those at highest risk; develop appropriate clinical guidelines based on the best scientific evidence; educate and involve physicians on implementation of those guidelines; leverage medical information computer systems to identify patients for intervention and measure clinical and financial outcomes; use of incentives for patients and providers to participate; and encourage goal setting by patients. (Goetzal et al, *Health Care Financing Review*)

¹⁰ Collaborative care is an example of a specific approach to chronic health management that has been successful. A 2006 article found collaborative care was associated with better control of chronic disease (Wasson et al., *J Ambulatory Care Manage*, 29(3):199-206.)

¹¹ Ejection fraction and six-minute walk test, specifically

¹² Cost is hospital operating costs and includes inpatient costs only. The range is the difference in average of hospital A v. hospital B (not a patient-level range).

4. Reduce cost of readmissions through comprehensive discharge planning and post-discharge support

CHF patients have the highest rate of readmissions among adult patients.^{xix} Compared to other states, Arkansas has a higher rate of CHF readmissions: the Dartmouth Atlas Project found that 22.4% of Medicare heart failure patients discharged in Arkansas are readmitted within 30 days, compared to a national median of 20.6% (50 state range: 15.5-23.1%, 25th and 75th percentiles 18.8, 21.5%).^{xx}

National studies have found that 37% of CHF readmissions are again for heart failure, while pneumonia is the second most common reason for readmission, accounting for 5.1% of readmissions among CHF patients.^{xxi}

Studies have demonstrated it is possible to reduce readmissions employing a variety of strategies. For example, data show that following up with a primary care physician soon after discharge prevents readmissions;^{xxii} however, fewer than half of all patients in Arkansas have an initial primary care visit within 14 days of discharge.^{xxiii} Telemonitoring and structured telephone support have also been found to reduce readmissions, improve quality of life and reduce costs by as much as 40%.^{xxiv,xxv,xxvi} As already mentioned, disease/case management programs have been successful in reducing readmissions as well as hospitalizations overall.

KEY DESIGN DECISIONS FOR NEW PAYMENT MODEL(S)

Following is a non-exhaustive list of the key design decisions that Medicaid, Medicare, and Commercial health insurers will need to make (either jointly or individually) in arriving at their new payment model(s) for CHF.

1. Episode definition: *clearly identifying when an episode begins and ends, which services are included; and criteria for patient inclusion/exclusion based on demographics, health status, diagnoses/procedures, and geographic regions*

2. Payment model: *prospective payment of a single bundled amount vs. retrospective payment that rewards high-performing providers; criteria for provider inclusion or exclusion based on scale, capabilities, performance, or other factors; pricing model to adjust for clinical severity, patient and/or provider geography, or other factors; level of financial risk (upside/downside)*

3. Administrative enablers: *requirements for data exchange, performance reporting, and/or management of inter-party financial flows necessary to enable new payment model*

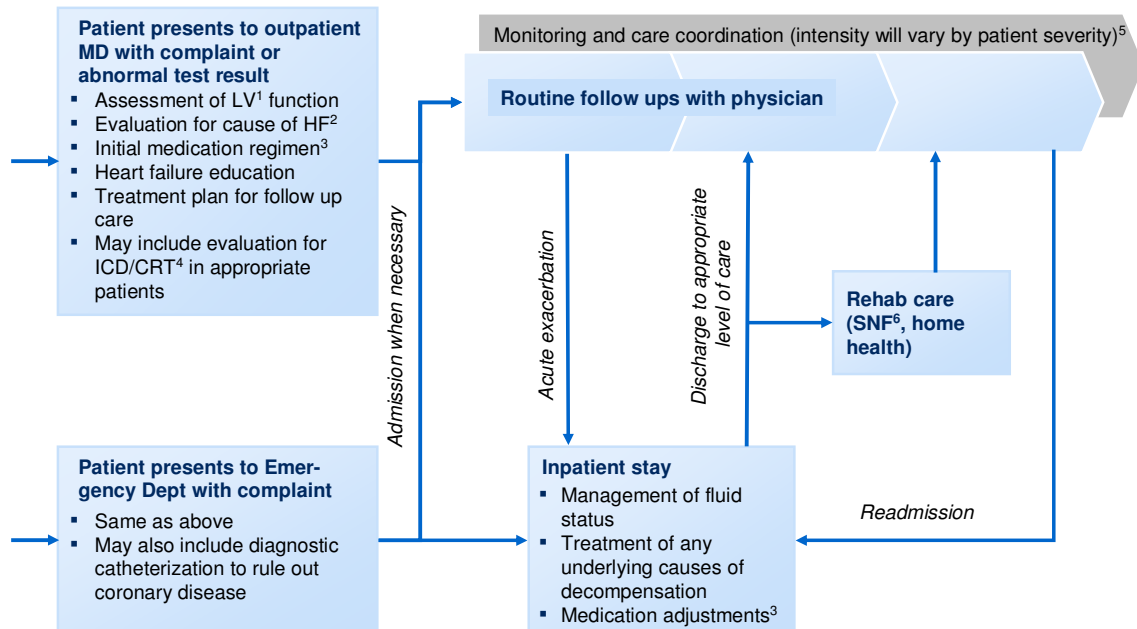
EXHIBIT 1

Preliminary working draft; subject to change

Congestive heart failure: Patient journey

DIASTOLIC
SYSTOLIC

Where patient enters the system



1 Left ventricular; 2 Heart failure; 3 Medication regimen differs for patients with systolic v. diastolic heart failure; 4 Implantable cardioverter defibrillator/cardiac resynchronization therapy; 5 May include third-party payor disease management, PBM medication management, wellness programs, remote monitoring; 6 Skilled nursing facility

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ⁱ Hunt SA, Abraham WT, Chin MH, et al. 2009 focused update incorporated into the ACC/AHA 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines: developed in collaboration with the International Society for Heart and Lung Transplantation. *Circulation*. 2009;119(14):e391.

ⁱⁱ Heart Failure Society of America

ⁱⁱⁱ HCUPNet

^{iv} Stevenson LW. Projecting heart failure into bankruptcy in 2012? *American Heart Journal*. 2011; 161(6):1007-10.

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- ^v Fonarow GC, CW Yancy, NM Albert, et al. Heart failure care in the outpatient cardiology practice setting: Findings from IMPROVE HF. *Circ Heart Fail* 2008;1:98-106.
- ^{vi} Krantz MJ, Ambardekar AV, Kaltenbach L, et al. Patterns and predictors of evidence-based medication continuation among hospitalized heart failure patients (from Get With the Guidelines-Heart Failure). *Am J Cardiol*. 2011 Jun 15;107(12):1818-23.
- ^{vii} CMS Hospital Compare data; hospitals with inadequate sample size excluded.
- ^{viii} HF discharge instructions: AR average 90%, U.S. average 89%; HF smoking cessation counseling: AR average 99%, U.S. average 99%.
- ^{ix} Fonarow GC. Improving quality of care and outcomes for heart failure: role of registries. *Circ J*. 2011 Jul 25;75(8):1783-90;
- ^x http://www.heart.org/HEARTORG/HealthcareResearch/GetWithTheGuidelinesHFStroke/GetWithTheGuidelinesHeartFailureHomePage/Get-With-The-Guidelines-Heart-Failure-Overview_UCM_307806_Article.jsp
- ^{xi} Emory Healthcare Heart Failure Statistics; <http://www.emoryhealthcare.org/heart-failure/learn-about-heart-failure/statistics.html>
- ^{xii} Greer SA, Nwaise IA, Casper ML. *Atlas of Heart Disease Hospitalizations Among Medicare Beneficiaries*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2010.
- ^{xiii} Chen J, SLT Normand, Y Wang, HM Krumholz. National and regional trends in heart failure hospitalization and mortality rates for Medicare beneficiaries, 1998-2008. *JAMA*. 2011;306(15):1669-1678.
- ^{xiv} Chen J, SLT Normand, Y Wang, HM Krumholz. National and regional trends in heart failure hospitalization and mortality rates for Medicare beneficiaries, 1998-2008. *JAMA*. 2011;306(15):1669-1678.
- ^{xv} Mattke S, M Seid, S Ma. *Am J Manag Care*. 2007;13:670-676.
- ^{xvi} Innovation profile: Heart failure disease management improves outcomes and reduces costs. Agency for Healthcare Research and Quality; <http://www.innovations.ahrq.gov/content.aspx?id=275>
- ^{xvii} Goetzel RZ, RJ Ozminkowski, VG Villagra, et al. Return on investment in disease management: A review. *Health Care Financing Review*. Summer 2005;26(4):1-19.
- ^{xviii} Data from American Hospital Directory, based on Medicare Cost Reports, 2010 data
- ^{xix} AHA 2005
- ^{xx} Goodman, DC, ES Fisher, CH Chang. After Hospitalization: A Dartmouth Atlas Report on Post-Acute Care for Medicare Beneficiaries, 28 September 2011.
- ^{xxi} Jencks, SF, MV Williams, EA Coleman. Rehospitalizations among patients in the Medicare fee-for-service program. *NEJM*. 2009; 360: 1418-28.
- ^{xxii} Naylor MD, Aiken LH, Kurtzman ET, Olds DM, Hirschman KB. The care span: The importance of transitional care in achieving health reform. *Health Affairs* 2011 Apr;30(4):746-54.
- ^{xxiii} Goodman, DC, ES Fisher, CH Chang. After Hospitalization: A Dartmouth Atlas Report on Post-Acute Care for Medicare Beneficiaries, 28 September 2011.
- ^{xxiv} Inglis SC, Clark RA, McAlister FA et al. *Eur J Heart Fail*. 2011 Sep;13(9):1028-40.

^{xxv} Naylor MD, DA Broton, RL Campbell, C Maislin, KM McCauley, JS Schwartz. Transitional care of older adults hospitalized with heart failure: a randomized, controlled Trial. *J Am Geriatric Soc* 2004; 52 (5):675-684.

^{xxvi} Naylor MD, Aiken LH, Kurtzman ET, Olds DM, Hirschman KB. The care span: The importance of transitional care in achieving health reform. *Health Affairs* 2011 Apr;30(4):746-54.